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(71) Applicant(s):
AMSAFE Bridport Limited
(Incorporated in the United Kingdom)
The Court, BRIDPORT, Dorset, DT6 3QU,
United Kingdom

(72) Inventor(s):
Julian Brown
Stephen Mark Trafford

(74) Agent and/or Address for Service:
Page Hargrave
Southgate, Whitefriars, Lewins Mead,
BRISTOL, BS1 2NT, United Kingdom

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GB 2411688 A GB 2027077 A
GB 1218860 A DE 029900794 U1

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Other: WPI, EPODOC

(54) Abstract Title: **Double stud fitting**

(57) A double stud fitting 102 comprises body 104, attachment aperture 106 through which a pallet net may pass, flanges 107, 108 and a locking plunger 110. Releasable attachment means is provided in the form of a spring clip 116 pivotally mounted to the body 104. When clip 116 is moved, aperture 106 is opened enabling the net to be released.

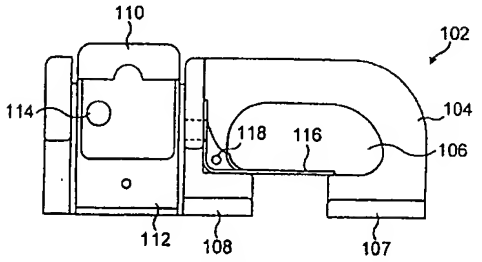


FIG. 2

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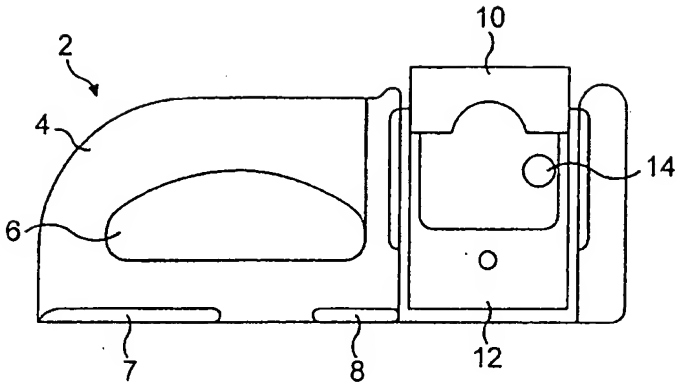


FIG. 1

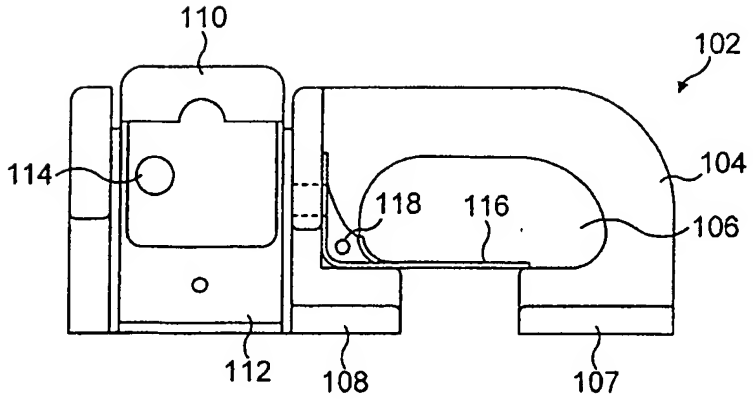


FIG. 2

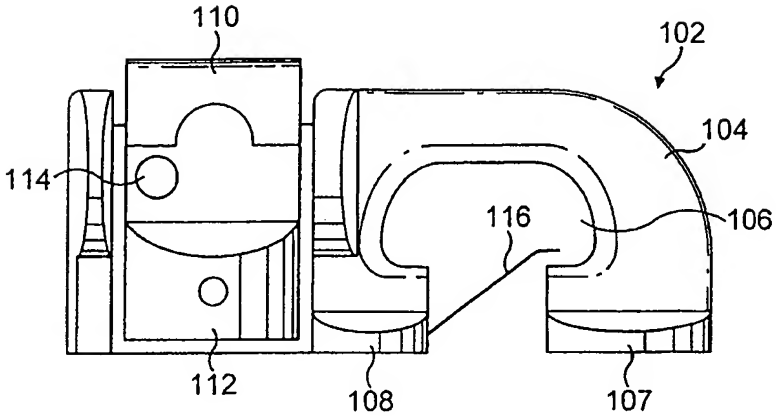
110
102
104
114
116
106
112
108
107

FIG. 3

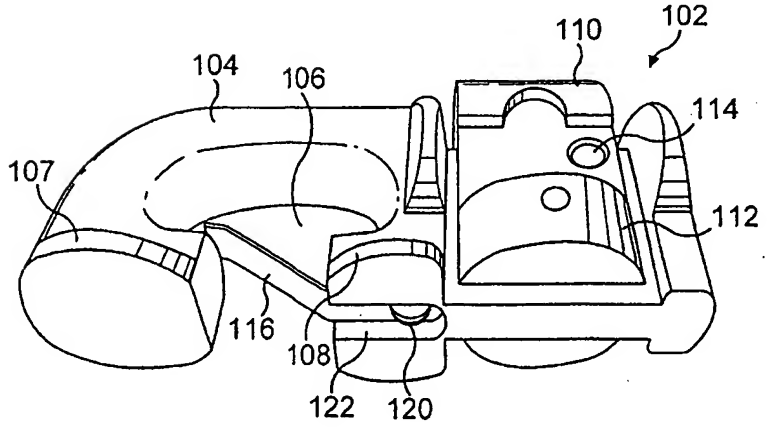
110
102
104
106
114
107
112
116
108
122
120

FIG. 4

# Double Stud Fitting

The present invention relates to double stud fittings.

Double stud fittings are used as secure fastenings which can be used to attach structures, such as nets, to an appropriate track or rail, which is often referred to as a seat track. In particular, double stud fittings are commonly provided around the periphery of pallet nets to enable the net to be securely attached to a seat track around the periphery of a pallet onto which a cargo has been loaded.

Double stud fittings used in air cargo equipment must currently conform to the approved standard set out in ISO 9788. Double stud fittings are well known in the relevant art and generally comprise a stud body, having an attachment aperture, and two flanges extending from a bottom portion of the stud body. In addition, they are generally provided with a plunger which is moveable relative to the stud body and is provided with a further flange on a bottom portion.

As mentioned above, double stud fittings may be used as attachment means in conjunction with a suitably configured seat track. The seat track is provided with pairs of openings that are slightly larger than the flanges on the stud body. In order to attach the double stud fitting to the seat track the plunger is lifted, such that its flange is raised above the level of the flanges on the stud body, and the flanges on the stud body are inserted into the openings in the seat track. Next, the double stud fitting is moved along the seat track by half a pitch, such that the flanges are no longer aligned with the openings and the flange on the plunger is now aligned with an opening. The plunger is then lowered to enable the flange on the plunger to enter an opening in the seat track. Since the seat track is provided with pairs of openings the double stud fitting may not be removed without first lifting the plunger. This ensures a secure fitting which may be used to attach a pallet net to a pallet. The plunger may also be provided with a locking mechanism to lock it in position on the seat track.

As mentioned above, double stud fittings are commonly used to attach pallet nets to pallets. It is well known to secure cargo to a platform of a pallet by means of a net lying over the cargo and secured to the pallet. Conventionally, such nets comprise a main panel, having a plurality of wing panels extending therefrom. The net typically has a generally rectangular main panel and four generally rectangular wing panels, thus forming a generally cruciform shape.

To secure the cargo on the pallet, the main panel of the net is lain on top of the cargo and the wing panels arranged to hang down against the sides of the cargo to surround the cargo. The meeting edges of adjacent wing panels are releasably secured together to form a corner by means of a so-called "lashing line" or "corner tie". The lashing line or corner tie is a cord which extends from the main panel of the net between the wing panels. To form the corner between adjacent wing panels, the lashing line or corner tie is threaded to and fro between the wing panels at the meeting edges in a downwards direction away from the main panel, to lace the meeting edges together, before being tied off with a knot, or secured by a hook, near the pallet. An alternative form of pallet net is described in WO 02/062619 in the name of AMSAFE Bridport Limited.

The bottom edges of the wing panels are provided with double stud fittings which are adapted to engage with a complementary seat track on the pallet, whereby the net is secured to the pallet as described above. The double stud fittings are typically spaced apart along the bottom edge of the wing panel by one normal diagonal dimension of the net mesh.

The double stud fittings are attached to the pallet net during the manufacture of the net. When the net is manufactured the double stud fitting forms what is known as a permanent fitting, which means that the double stud fitting can only be removed by cutting the net material or the double stud fitting. If the double stud fitting gets damaged then the pallet net must be cut in order to allow the double stud fitting to be replaced. This repair also requires the pallet net to be repaired in addition to the replacement of the double stud fitting.

It is the object of the present invention to alleviate some of the problems of existing double stud fittings, or at least to provide an alternative to them.

According to the present invention there is provided a double stud fitting comprising releasable attachment means. The term "releasable" as used herein refers to the ability of the double stud fitting to be released from a net, or other structure to which it is attached, without the need to cut the double stud or net. The releasable attachment means enables the double stud fitting to function as a semi-permanent fitting, rather than a permanent fitting. This offers benefits for the repair and replacement of the fittings.

The releasable attachment means is preferably provided with a locking mechanism. The locking mechanism allows the releasable attachment means to be locked in a closed position.

The releasable attachment means is preferably provided in an attachment aperture of the double stud fitting. This enables the double stud fitting to be quickly removed from the net, or other structure, to which it is attached. If the double stud fitting on a pallet net is damaged in service, then conventionally the net material has to be cut to allow a replacement double stud fitting to be fitted. With the present invention the releasable attachment means enables the damaged double stud fitting to be removed without the need to cut the net material. In addition, it is a simple matter to attach a replacement double stud fitting, again without the need to cut the net material. The present invention results in substantial savings in both time and costs.

Since the present invention avoids the need to cut the net material when replacing double stud fittings it has the additional advantage that the net profile remains unchanged. In some situations when a repair is carried out on a pallet net with conventional double stud fittings the repair can cause the net geometry to be altered, sometimes by the addition of a further ring member to the double stud fitting. The alteration of net geometry is undesirable and may not conform to the regulations for pallet nets.

The releasable attachment means may conveniently be located in a lower portion of the double stud fitting. Alternatively, the attachment means may be located in an upper portion of the double stud.

The releasable attachment means is preferably in the form of a spring clip. In such a configuration the spring biases the clip into the closed position such that the attachment aperture is closed and any structure, such as a net, which passes through the attachment aperture is held securely in place. The spring clip is preferably formed such that when it is in the closed position it lies flush with the periphery of the attachment aperture. When the spring clip is in the closed position the locking mechanism may be activated to securely retain the clip in the closed position. This allows the double stud fitting to function more as a permanent fitting, while still having the flexibility of easy replacement.

According to a second aspect of the present invention there is provided a net comprising at least one double stud fitting having a releasable attachment means. The net may suitably be a pallet net.

According to a third aspect of the present invention there is provided a pallet for use with a pallet net, the pallet comprising a seat track and at least one double stud fitting having a releasable attachment means. This offers the advantage that it may be used in conjunction with pallet nets which are not provided with any double stud fittings. The double stud fittings are provided with the attachment means in an upper portion of the double stud fitting and are permanently or semi-permanently located on the pallet. When the double stud fittings are semi-permanently attached to the seat track of a pallet net they may conveniently be removed by the use of a suitable tool. The pallet net may simply be clipped into the double stud fittings in order to secure a load on the pallet.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows a side view of a prior art double stud fitting;

Fig. 2 shows a side view of a double stud fitting according to the present invention;

Fig. 3 shows a side view of a further double stud fitting according to the present invention; and

Fig. 4 shows a perspective view of the underside of the double stud fitting of Fig. 3.

Referring firstly to Fig. 1, this shows a side view of a double stud fitting 2 as is well known in the art. Such double stud fittings 2 are commonly used as secure fasteners for a variety of purposes, such as for securing pallet nets to pallets. The double stud fitting 2 comprises a stud body 4. The stud body 4 defines an attachment aperture 6, through which a structure, such as a strand of a pallet net, may pass. When the double stud fitting 2 is fitted to a pallet net it becomes what is known as a permanent fitting, that is it is fitted when the net is manufactured and cannot be removed without cutting the net or the stud body 4.

The stud body 4 is provided with flanges 7, 8 which extend from a lower portion of the stud body 4 on both sides of the double stud fitting 2. In addition, the double stud fitting 2 is provided with a plunger 10 which is moveable with respect to the stud body 4. The plunger 10 is moveable along a vertical axis of the stud body 4 and is biassed into its lower position as shown in Fig. 1. The plunger is provided with a flange 12 on both sides of the stud body 4. The flange 12 extends outwardly to the same degree as the flanges 7, 8 but it is substantially taller than the flanges 7, 8. When the plunger 10 is in its lower position, as shown in Fig. 1, the flange 12 is substantially aligned with the flanges 7, 8 on the stud body 4.

The plunger 10 is also provided with a locking mechanism. A hole 14 is provided in the plunger 10. When the plunger 10 is in its lower position the hole 14 in the plunger 10 is aligned with a corresponding hole in the stud body 4. Insertion of a

suitable locking member (not shown) into the hole 14 in the plunger 10 causes the plunger 10 to be locked securely in place.

The double stud fitting 2 is used as attachment means in conjunction with a suitably configured seat track (not shown). The seat track is provided with pairs of openings that are slightly larger than the flanges 7, 8 on the stud body 4. In order to attach the double stud fitting 2 to the seat track the plunger 10 is lifted, such that its flange 12 is raised above the level of the flanges 7, 8 on the stud body 4, and the flanges 7, 8 on the stud body 4 are inserted into the openings in the seat track. The double stud fitting 2 is then moved along the seat track by half a pitch, such that the flanges 7, 8 are no longer aligned with the openings and the flange 12 on the plunger 10 is now aligned with an opening. The plunger 10 is then lowered to enable the flange 12 on the plunger 10 to enter an opening in the seat track. Since the seat track is provided with pairs of openings the double stud fitting 2 may not be removed without first lifting the plunger 10. This ensures a secure fitting which may be used to attach a pallet net to a pallet. With the plunger 10 locked in position the double stud fitting 2 may only be released when desired.

Turning now to Fig. 2, this shows a side view of one embodiment of a double stud fitting 102 according to the present invention. The general configuration of the double stud fitting 102 is similar to that of the prior art double stud fitting 2 and like parts will be labelled with the same reference numeral increased by 100.

The double stud fitting 102 comprises a stud body 104. The stud body 104 has an attachment aperture 106, through which a structure, such as a strand of a pallet net, may pass.

The stud body 104 is provided with flanges 107, 108 which extend from a lower portion of the stud body 104 on both sides of the double stud fitting 102. In addition, the double stud fitting 102 is provided with a plunger 110 which is moveable with respect to the stud body 104. The plunger 110 is moveable along a vertical axis of the stud body 104 and is biassed into its lower position as shown in Fig. 2 by means of a

spring (not shown).The plunger is provided with a flange 112 on both sides of the stud body 104. The flange 112 extends outwardly to the same degree as the flanges 107, 108 but it is substantially taller than the flanges 107, 108. When the plunger 110 is in its lower position, as shown in Fig. 2, the flange 112 is aligned with the flanges 107, 108 on the stud body 104.

As before, the plunger 110 is provided with a locking mechanism. A hole 114 is provided in the plunger 110. When the plunger 110 is in its lower position the hole 114 in the plunger 110 is aligned with a corresponding hole in the stud body 104. Insertion of a suitable locking member (not shown) into the hole 114 in the plunger 110 causes the plunger 110 to be locked securely in place.

Unlike the prior art double stud fitting 4 the attachment aperture 106 is not defined solely by the stud body 104. The double stud fitting 102 is provided with a releasable attachment means in the form of a spring clip 116. The spring clip 116 is pivotally mounted to the stud body 104 about a pivot point 118. In a first position the spring clip 116 abuts the stud body 104 and, in conjunction with the stud body 104, defines the attachment aperture 106. The spring clip 116 is resiliently biassed into the first position by means of a spring (not shown) or other suitable biassing means. The spring clip 116 is moveable from its first position to a second position, in which the attachment aperture 106 is opened. In the second position any structure, such as a strand of a net, which was attached to the double stud fitting 102 may be removed.

Referring now to Figs. 3 and 4, these show a second embodiment of a double stud fitting 102 according to the present invention. The general configuration of the double stud fitting 102 is the same as that of the double stud fitting 102 of Fig. 2 and like parts will be labelled with the same reference numeral.

The double stud fitting 102 comprises a stud body 104. The stud body 104 has an attachment aperture 106, through which a structure, such as a strand of a pallet net, may pass.

The stud body 104 is provided with flanges 107, 108 which extend from a lower portion of the stud body 104 on both sides of the double stud fitting 102. In addition, the double stud fitting 102 is provided with a plunger 110 which is moveable with respect to the stud body 104. The plunger 110 is moveable along a vertical axis of the stud body 104 and is biassed into its lower position as shown in Figs. 3 and 4 by means of a spring (not shown) .The plunger is provided with a flange 112 on both sides of the stud body 104. The flange 112 extends outwardly to the same degree as the flanges 107, 108 but it is substantially taller than the flanges 107, 108. When the plunger 110 is in its lower position, as shown in Fig. 2, the flange 112 is aligned with the flanges 107, 108 on the stud body 104.

As before, the plunger 110 is provided with a locking mechanism. A hole 114 is provided in the plunger 110. When the plunger 110 is in its lower position the hole 114 in the plunger 110 is aligned with a corresponding hole in the stud body 104. Insertion of a suitable locking member (not shown) into the hole 114 in the plunger 110 causes the plunger 110 to be locked securely in place.

The attachment aperture 106 is defined in part by the stud body 104 and in part by a releasable attachment means, in the form of a resilient steel spring 116. One end of the resilient steel spring 116 is secured in a recess 122 in the underside of the stud body 104 by means of a screw 120. The other end of the resilient steel spring 116 is free and lies substantially flush with the inner periphery of the attachment aperture 106.

The resilience of the steel spring 116 biases it into a first position in which is closes the attachment aperture 106. The steel spring 116 may be deflected into the attachment aperture 106 in order to enable attachment of the double stud fitting 102 to a net or other structure. The steel spring 116 will be deflected inwards by the action of pulling a strand of the net against the steel spring 116. Once the strand is located within the attachment aperture 106 the resilience of the steel spring 116 will return it to its initial position, thus securing the double stud fitting 102 to the net. The abutment of the free end of the steel spring 116 with the inner periphery of the

attachment aperture 106 prevents the steel spring 116 from being bent out of the attachment aperture 106.

The spring clip and resilient steel spring 116 are merely two possible embodiments of the releasable attachment means and it will be clear to someone skilled in the art that a variety of alternative constructions may take their place. For example, any suitable construction which allows the attachment aperture 106 to be opened would be suitable.

It is preferred that the releasable attachment means 116 lies flush with the stud body 104 when it is in its first position. It is also important that the overall strength of the double stud fitting is not adversely affected. The double stud fitting 102 should still conform to the standard set out in ISO 9788.

In an alternative embodiment of the present invention the releasable attachment means may conveniently be provided in an upper portion of the stud body 104. This offers the advantage that the double stud fittings 102 could be attached to a pallet and the pallet net itself could be provided with no double stud fittings 102 at all. To secure cargo on the pallet a pallet net would be lain on top of the cargo as before. The meeting edges of adjacent wing panels would then be secured. The bottom edges of the wing panels would then be clipped into the double stud fitting. Alternatively, the bottom edges of the wing panels may be secured prior to the securing of the meeting edges. This allows the pallet net to be rapidly and securely attached to the pallet without the need to provide double stud fittings on the pallet net. This offers a greater degree of flexibility than is offered with the prior art double stud fittings. The spring clip is similar to a carabiner clip used in mountaineering.

**Claims**

1. A double stud fitting comprising releasable attachment means.

2. A double stud fitting according to claim 1, wherein the releasable attachment means is provided with a locking mechanism.

3. A double stud fitting according to claim 1 or claim 2, wherein the releasable attachment means is provided in an attachment aperture of the double stud fitting.

4. A double stud fitting according to claim 3, wherein the releasable attachment means is located in a lower portion of the double stud fitting.

5. A double stud fitting according to claim 3, wherein the releasable attachment means is located in an upper portion of the double stud.

6. A double stud fitting according to any preceding claim, wherein the releasable attachment means is in the form of a spring clip.

7. A double stud fitting according to claim 6, wherein the spring clip is pivotably mounted on the double stud fitting.

8. A net comprising at least one stud fitting according to any preceding claim.

9. A net according to claim 8, wherein the net is a pallet net.

10. A pallet for use with a pallet net, comprising a seat track and at least one double stud fitting according to claim 5.

11. A double stud fitting substantially as hereinbefore described with reference to the accompanying drawings.

10. A net substantially as hereinbefore described with reference to the accompanying drawings.

12. A pallet substantially as hereinbefore described with reference to the accompanying drawings.

**Application No:** GB0516529.5 **Examiner:** Vaughan Phillips

**Claims searched:** 1-12 **Date of search:** 16 September 2005

## Patents Act 1977: Search Report under Section 17

**Documents considered to be relevant:**

| Category | Relevant to claims | Identity of document and passage or figure of particular relevance |
|---|---|---|
| X,E | 1, 8 at least | GB 2411688 A (S.V.S. LTD.) see abstract |
| A | - | GB 2027077 A (L'AIGLON) see Fig. 6 |
| X | 1, 8, 10 at least | GB 1218860 A (HAWKER SIDDLEY) see the Figs. |
| A | - | DE 29900794 U1 (BERREZOUGA) see Figs. 16-20 |

Categories:

| | | | |
|---|---|---|---|
| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention. |
| & | Member of the same patent family | E | Patent document published on or after, but with priority date earlier than, the filing date of this application. |

**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC$^{X}$ :

E2A

Worldwide search of patent documents classified in the following areas of the IPC$^{07}$

B60P; F16G

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC